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Risen Apes and Fallen Angels: The New Museology of Human Origins

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Abstract There has been a little explosion of "origin" exhibitions in the past few years. The recent bicentennial of Darwin's birth, in 2009, ushered in a bevy of traveling exhibitions and events. Grand-scale permanent exhibitions have recently opened at the American Museum of Natural History (the Spitzer Hall of Human Origins) in New York, and the Smithsonian's National Museum of Natural History (the David H. Koch Hall of Human Origins) in Washington, D.C. A new museology is afoot, and some of the recent changes are worth tracking. And let's not forget the recently opened Creation Museum in Petersburg, Kentucky. Even in creationist thinking, where views seem eternally and stubbornly intransigent, there are new fads and museological fashions.

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Recent polls of American attitudes regarding evolution and creationism are remarkably consistent. In the last few years, independent polls by Gallup, the Pew Research Center, and Fox News have all found that two-thirds of Americans favor the idea of adding creationism to the school curriculum. For those of us who find Darwin's theories to be coherent, compelling, and even emancipatory, those figures are depressing.

The polls differ, however, in their findings of what Americans actually believe about the origins of cosmos, life, and species. On the substantive issues, the meanings of the polls are much less clear. Most polls agree that 44 to 46 percent of Americans subscribe to the standard creationism model, in which God created the world in six days (the Genesis origin story). This is a remarkably high number and indicates a rather low degree of scientific literacy in what is otherwise a highly developed country. If we subtract the other clear-cut group, the atheists who comprise approximately 13 percent of the population, then we arrive at some 42 percent of Americans who occupy the middle ground, and who fall somewhere between the two extremes.

Depending on how the polling questions are asked, Americans demonstrate a variety of "compromise" positions. These range from

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Photo 1. The Creation Museum's suggested caption: "A visitor . . . points out to his children several animatronic herbivorous dinosaurs, sharing space with models of creation-era children at play." *Photo courtesy of the Creation Museum.*

inconclusive skepticism about whether or not the fossil record "proves" evolution, to forms of "theistic evolution" wherein God uses the law of natural selection to unfold His divine plan, and even to New Age options that suggest we're all evolving toward "God-consciousness."

FALLEN ANGELS

Into this swamp of possibilities steps the recent Creation Museum in Kentucky, which holds up the banner of six-day creation and hopes to win the moderates and compromisers over to its side. In the spring of 2010, the museum celebrated its one-millionth visitor. I toured the Creation Museum and interviewed its director.

Inside the $27-million-dollar museum, one is immediately confronted by a bizarre animatronic scene—a small girl playing next to a juvenile *T. rex.* She is apparently unaware that her species arose 64 million years after the extinction of dinosaurs. But this is only the first in a long line of polemical "challenge exhibits" designed to undercut the idea that the earth is billions of years old. This evangelical museum is an offshoot of Answers in Genesis (AiG), which is run by Ken Ham, president and CEO. Ham, who holds a B.S. in applied science from the University of Queensland, is author of titles such as *The Lie: Evolution*, and *Walking through Shadows: Finding Hope in a World of Pain*. In addition to books, AiG produces a creationist magazine, and a variety of Christian DVDs, CDs, and so on. Ham and his board of directors—each of whom he calls "a godly man who walks with the Lord in wisdom and maturity"—have been "upholding the authority of the Bible" since 1994. In December of 2010, it was announced that the governor of Kentucky was granting these same godly men huge tax breaks to develop a giant Noah's ark theme park. Bible-based tourism, with its non-scientific origin stories, is picking up momentum.

Photo 2. Families in the Creation Museum examine "the life-size, animatronic Utahraptor, a velociraptor-type dinosaur whose remains were discovered in Utah in 1993." *Photo courtesy of the Creation Museum.*

Ham and his organization believe that the time is ripe for a rebuttal museum. The promotional material on the AiG website states: "Almost all natural history museums proclaim an evolutionary, humanistic worldview. For example, they will typically place dinosaurs on an evolutionary timeline millions of years before man. AiG's museum will proclaim the authority and accuracy of the Bible from Genesis to Revelation, and will show that there is a Creator, and that this Creator is Jesus Christ (Colossians 1:15–20), who is our Savior."

After the animatronics in the foyer, one is quickly shuttled into a high-tech movie theater to watch *Men in White*, a "humorous" and awkwardly preachy spoof of the Hollywood film *Men in Black*. Here the hip, sunglass-wearing protagonists are actually archangels Michael and Gabriel ("Mike" and "Gabe"), and they give us (and an animatronic purpose-driven searcher named Wendy) a quick tour of the "problems" with modern science. Science is represented entirely by a congregation of dogmatic egghead teachers, who espouse—shriek, actually—such "dubious" doctrines as geology, evolution, fossil-dating methodology, and basic cosmology. The lovable wisecracking Mike and Gabe vanquish them all, while the audience is thumped and rocked by motorized theater chairs and even sprayed with water during the jocular Flood sequence.

From here it's just one unsettling display of edutainment after another, culminating in a relatively gory film about Jesus's bloody sacrifice

Photo 3. The sign in a new exhibition at the Creation Museum states: "Natural Selection is Not Evolution." *Photo courtesy of the Creation Museum.*

for "you and me." Along the way, we get to walk inside a scaled section of Noah's ark. We learn that pornography, suicide, and abortion are on the rise due to evolution's nihilism. We hear that the Grand Canyon was formed in a few weeks. We spend two to three hours touring the

Photo 4. The Creation Museum bookstore. *Photo courtesy of the Creation Museum.*

"Seven Cs, in God's Eternal Plan": Creation, Corruption, Catastrophe, Confusion, Christ, Cross, and Consummation.

When I visited, I discovered no way to break off the tour at any point prior to Consummation. About two hours in, I started to get claustrophobic; the spaces seemed to get tighter and darker as I walked the eschatological narrative. I decided to step away—just as racism and crime were being blamed on Eve's taste for forbidden fruit. I tried to find an exit to the cafeteria ("Noah's Café") so I might nourish my weakening spirit. To my horror, I discovered that one cannot actually exit anywhere along the pathway. The herding is so absolute that when you attempt to backtrack, you find that the doors you've been entering have no handles on the opposite side. Like someone in a haunted house, you must complete the entire circuit.

It's not quite accurate to call this evangelical center a "museum." It contains almost no "information," unless you count as information speculations on how Noah kept dinosaurs on the ark. It offers no new observations about nature, unless you think that inferring a Designer can be called observational. Unlike most other nature museums, it has no "research" component whatsoever. When I asked Mark Looy, vice president for AiG ministry relations, where the research labs and archive collections were

located, he confessed that he didn't understand the question. "This is a museum," he finally said, chuckling.

What the Creation Museum does have, however, are copious ways of needling accepted and established theories of science with puerile conspiracies and misguided quests for certainty. "The big issue in the museum that we deal with," Ken Ham told me, "is helping people to see the difference between using the scientific method in the present—what's called operational science—and one's origin beliefs."

"An evolutionist," continued Mark Looy, "looks at a dinosaur bone and says it must be 65 million years old. We look at the same bone and say that the creature was probably covered by a global flood about 4,400 years ago. Same evidence, same bone, just a different interpretation."

Americans—even evangelical Americans—believe the power of "choice" is supreme, and so a growing number of Christians feel comfortable choosing a different origin story than the materialist scientific one. The Creation Museum emboldens them to do so because it invokes a naive "show me" empiricism: "Hey, I don't see evolution happening." The exhibits repeatedly ask visitors, for example, to consider this: Dinosaur bones don't come out of the ground with their dates printed on them, so why should we believe the crazy scientists with their theoretical dating methods? This so-called "empiricism" gives them just enough skepticism to doubt the secular culture they're immersed in, but not enough to doubt their own Biblical culture. It also seems ironic that secular museums historically borrowed the visual rhetoric and architecture of sacred temples to lend gravitas and credibility to their claims, and now the Creation Museum is borrowing the visual rhetoric of secular museums to make their religious claims more credible.

THE NEW CREATIONISM

In some ways, of course, the new creationism is the old creationism. Darwin and biology take center stage in the parade of modern evils, but new trends are on display as well. For one thing, they've stepped up their game, in terms of edutainment. Borrowing heavily from the animatronic and melodramatic rhetoric of contemporary secular museums, the Creation Museum has an array of "fun" exhibits. Kids are invited to ride atop dinosaurs, climb inside Noah's ark, press buttons, and enjoy a weird fantasy version of prehistory that includes imaginary combinations of dragons and dinosaurs—many of whom appear to be drawn from the Flintstones, rather than real paleontology.

A very significant change, in both museology and theology, is that some of the heat has been taken off Darwin per se and has been placed on geology. "I think one of the big issues in this whole topic," Ken Ham explained to me, "is obviously the age of the earth—the question of millions of years versus thousands of years. That issue is even more key than the business of Darwinian evolution. And I believe that there is very compelling evidence in our displays, and in the DVDs that we produce, to show that the earth is not millions of years old."

The socially conservative political stance of the museum is prevalent in almost every exhibit, but the coup de grace is Culture in Crisis. In this installation, the museum gives us a "natural history" of the breakdown of the American family. Visitors are invited to look through three windows of a contemporary American home. Videos loop to show two young boys looking at porn on the computer and experimenting with drugs. Another window shows a young girl crying, surrounded by abortion pamphlets. And finally the parents are shown arguing. A re-created church facade stands at the

other end of the room, but the foundation of the church has been damaged by a large wrecking-ball labeled "millions of years." The signage explains that the cause of all this misery is our move away from Genesis and toward the scientific ideas of geology. Ideas about an old earth make people feel small and insignificant, so naturally they do drugs and have abortions.

To play on Max Weber's famous terminology, the Creation Museum exhibits the world as an "enchanted garden." It may be defiled temporarily by the sins of man, but the world is a magical place wherein God cares about human beings and codes nature with secrets and signs of his power and purpose. The evolutionist, on the other hand, lives in a much larger, older, and more mechanical version of nature. The late Stephen Jay Gould once described his metaphysical worldview as "the 'cold bath' theory that nature can be truly 'cruel' and 'indifferent' . . . because nature was not constructed as our eventual abode, didn't know we were coming (we are, after all, interlopers of the latest geological microsecond), and doesn't give a damn about us (speaking metaphorically)." And Gould writes, "I regard such a position as liberating, not depressing." The Creation Museum, on the other hand, finds this "cold bath" view very depressing, and it's the reason, organizers say, why the American family is disintegrating.

Most mainstream moderate Christians read the Bible figuratively rather than literally and they see God as the maker of natural laws, from the Big Bang to natural selection. They are comfortable with modern science and for them God is not a micromanager of nature, nor an intruder on the free-will affairs of the human species. But the Creation Museum characterizes these moderates as part of the problem. For the Kentucky museum, acceptance of an ancient earth—acceptance of geology and cosmology—is tantamount to nihilism.

Another important aspect of the new creationist museum is an intensive revision of Christian ideas about race. Most prescientific cultures have had stories about the origins of human races. The Cherokee Native Americans have the well-known legend that God cooked the first humans in a clay oven, undercooking the white folks, overcooking the black folks, and cooking the brown folks just right. Ethnocentrism usually plays a big role in shaping any cultural story about human origins. Christian tradition is no different. It has repeatedly told a story about the origin and descent of man, based on Genesis, Chapter Nine. Two very important themes arise from this chapter, in particular the "origins" claim that "the sons of Noah, who came out of the ark, were Shem, Ham, and Japheth . . . and from these was all mankind spread over the whole earth" (Genesis 9:18–19). And the other important passage in Chapter Nine is the influential "curse of Ham" verse in which Noah banished his youngest son for an egregious misdeed. This legend eventually served as a map by which Christians viewed infidel races, who were purportedly descendents of the condemned Ham.[1]

Christian anti-abolitionists in the antebellum United States used these Genesis passages to deny racial egalitarianism. But none of this appears in the new Creation Museum. There are two rooms devoted to the story of Ham, Shem, and Japheth. There's no real mention of a "curse." Large poster paintings illustrate migration patterns of Ham's descendants out of the Middle East toward Africa and Asia. The biblical story is represented accurately but the use of it is completely revised. Visitors are taught that this Genesis story is the proof and the celebration of human solidarity. The museum plaques inform us that the biblical story of racial origins attests to the fact that we are all related as one human family. According

to the museum, the bible story is an antiracist defense of racial equality. This is a genius new spin on an old story—taking a previously divisive and racist origin story and reversing it into a message of liberal tolerance and enlightenment. So why, then, is there racism? You guessed it: the usual suspects, Darwin and science generally.

The Creation Museum displays the most egregious forms of Social Darwinism, which Darwin never proffered or sanctioned, and claims that racism is the product of scientific materialism. Yes, some racist eugenics proponents offered bogus evolutionary justifications for their odious ideas in the late nineteenth and early twentieth centuries, but these were horrific distortions and misrepresentations of Darwinian ideas.[2] Never mind. It suits the Creation Museum to claim that science divides people, and the bible unites them. Biology is blamed for modern racism. A giant old photo of a slave, whose naked back is scarred by whipping, is displayed next to a photo of emaciated Auschwitz survivors, and a giant text headline over them reads "According to Human Reason . . . ." This continues a thread running throughout the museum: human reason (especially science) causes all of the suffering in the world. This thread connects the latest atrocities of genocide with the earlier dioramas of Adam and Eve in the garden, where curiosity caused Eve to snack from the tree of knowledge.

When you finally spill out of this ball of confusion into the gigantic gift shop, you become keenly aware of the unholy mixing of piety and profit. Someone is making a fortune on this stuff. The museum speaks directly to the anxieties of a fearful subculture that sees its family values under attack by a rising secular tide. The visitors at the Creation Museum feel like David, facing the secular giant Goliath. They see themselves as underdogs of righteousness who've chosen an origin story that's different from the science story. Like bad reality television that drives up ratings with violent and abusive scenarios, the museum drives up profits by demonizing science. The search for meaningful origin stories is understandable, of course, but the museum's suggestion that science causes nihilism and racism is inexcusable.

RISEN APES

Secular culture has been representing human origins to the masses for over a century. Some of the earliest hominin skulls, sculptures, and dioramas date back to the World Fairs, like the Paris World Exhibition of 1900. Even earlier, in 1856, miners had discovered mysterious skull fragments in the Neander Valley, Germany. As more of these fossils emerged, replicas began to find their way into public midways and festivals. Even huckster P. T. Barnum got into the new craze for "missing links" when, in 1860 (only one year after Darwin's *Origin of Species*), he began displaying a micro-cephalic African American man as a living transitional fossil.

The first significant permanent exhibition on human origins was Henry Fairfield Osborn's Hall of the Age of Man at the American Museum of Natural History in the 1920s. This was followed by the Hall of the Stone Age of the Old World at the Field Museum of Natural History in Chicago in 1933.[3]

It's fitting, then, for the AMNH to bring out its recent Spitzer Hall of Human Origins as a new flagship of museology. There is much to praise in the new AMNH exhibition, which was funded by a $15-million-dollar grant from Anne and Bernard Spitzer. The story of our ancient ancestors, and our own precarious development, is intrinsically dramatic. And the new museology is better able to convey the drama, by breaking down some of the

Photo 5. In the entrance of the AMNH's Hall of Human Origins, life-size skeletons of a chimpanzee, a modern human, and a reconstructed Neanderthal. Behind them are images of cells, chromosomes, and bone scans. *Photo courtesy of the American Museum of Natural History.*

traditional glass walls between visitors and specimen mounts. The new AMNH exhibition discards some of the old "spectator paradigm" and puts visitors in the action, so to speak.

One of the central displays contains the Laetoli footprints, which helped confirm the upright bipedal gait of Australopithecines around 3.6 million years ago. A lucky conjunction of volcanic ash, rain, and more ash in what is now Tanzania sealed a simple 80-foot stretch of hominin footprints for millions of years until Mary Leakey's team discovered them in 1976. The museum has cleverly put a cast of this famous perambulation in the open exhibition space for visitors to navigate around, and even step on. And it's reintroduced the old "scandalous" (genitally equipped) Australopithecine couple as the manikin versions of the Laetoli strollers.

More classical dioramas surround the Laetoli hominids, and give us glimpses into the Neanderthal home life, the struggles of *Homo erectus* with hyenas, and the struggles of *Homo sapiens* with the Ice Age climate. This section of the exhibition is fun, but feels old school. Not only is the presentation of manikins straight out of the Carl Akeley-era style, but we're given little understanding of the anatomical, cultural, and psychological continuities and differences that define these hominids. This part of the

Photo 6. A fully articulated reconstruction of a complete Neanderthal skeleton, combining casts of parts of six individuals from four countries. *Photo courtesy of the American Museum of Natural History.*

exhibition works well if you're already a fan of conventional natural history displays.

The AMNH exhibition then opens into a celebration titled One Human Species. Here we see the same sorts of maps charting human migration that we found in the Creation Museum's eccentric presentation of Noah's family migration. But at the AMNH, of course,

Photo 7. The History of Human Evolution section includes the well-known Australopithecus couple, icons from the former Hall of Human Biology, walking side by side. *Photo courtesy of the American Museum of Natural History.*

we have the scientifically researched facts of how *Homo sapiens*, which emerged out of Africa 150,000 years ago, spread out over every continent. This migration put different environmental-selection pressures on us—creating different skin colors and body types—yet we now have

proof from the DNA that we all share 99.9 percent of our collective genetic makeup. Science confirms our unity.

Finally the AMNH asks, in another title: What Makes Us Human? The message here is inevitable in any treatment of human evolution; we find it addressed in the Smithsonian's exhibition as well. After the visitor is shown the myriad ways that human history is so patently simian, a sweet dessert is needed to demonstrate that we are much more than hairless apes. So we are treated to an anti-reductionist celebration of human symbolic thought and culture. Displays include information about the complexity of human language and the importance of creativity. Interactive kiosks invite visitors to compose music and art on touchscreens. It's an effective presentation that reminds us of what a huge game-changer a bloated neocortex can be. Yes, we have animal origins, but the dazzling powers of the human intellect (just a few of which are on display here) remind us why so many religions describe the mind as the spark of the divine.

Near the end of the Spitzer Hall, a video kiosk presenting near-life-sized images of science administrator Ken Miller, Catholic biologist Eugenie Scott, and geneticist Francis Collins, waxes philosophical about evolution and faith.[4] Collins, a "theistic evolutionist" who founded an organization called BioLogos in 2007 to explore religion-and-science intersections, offers most of the edifying reflections. Collins has since moved on to be the director of the National Institutes of Health—he was nominated by President Obama—but the AMNH is clearly happy to present his theory that religion and science are allies. The atheist new-guard—Richard Dawkins or Sam Harris, for instance—is not invited to convey its message of religion-and-science incompatibility. The AMNH wants to reassure and accommodate visitors. The kiosk video feels like a bit of a sop, however: tacked on the end of an otherwise strong exhibition in order to pacify a specific visitor contingent.

The Smithsonian, by contrast, seems to avoid this careful placating, sensitive tiptoeing, and accommodating consideration. Refreshingly, the David H. Koch Hall of Human Origins does not treat the visitor with kid gloves. The curators do not seem nervous about evangelical blowback. They don't waste time and space repeatedly reassuring visitors with plaques and videos about the dignity of everyone's diverse cultural beliefs.

Darwin himself carefully introduced his *Origin of Species* with prudently chosen frontispiece quotes. The first was from William Whewell, who wrote that thinking of nature as comprised of laws (as science does) is no less pious than thinking of nature as a field of miraculous "interpositions of divine power." Darwin also quoted Francis Bacon's recommendation that we should always endeavor to dig deeper into the book of nature, and not be put off by fear. American museology has followed this prescription of honey and medicine for over a century, but a new poise may be showing up in the rhetoric of display.

In the new Koch Hall, a computer touchscreen exhibit titled Religion and Evolution appears way off the beaten path in a side branch of the main exhibition. Visitors can click on questions like "Can the concept of evolution co-exist with religious faith?" "How can we reduce the conflict between religion and science?" "How does evolution relate to cultural beliefs about our origins?" The screens continue by neutrally describing some of the well-worn options. The tone is purely descriptive: Some people see religion and science in conflict, others see no conflict. "Still others see a much stronger and constructive relationship between

religious perspectives and evolution," says the touchscreen. This quick phrase acknowledges the long tradition of natural theology, extending from Asa Gray during Darwin's time, to the Templeton Foundation in our own day, which looks for evidence of God in the works of nature. While this is no longer a respectable scientific perspective, such thinking is alive and well in the personal views of the visiting public and many professional scientists.

In this almost perfunctory touchscreen display, we find some galvanizing confidence. In the section on religion and evolution, cultural stories are acknowledged. The touchscreen explains that different societies from all around the world tell origin stories that give them meaning and purpose and social solidarity. But without any pause for handwringing multicultural affirmation, the text announces: "This exhibit presents research and findings based on scientific methods that are distinct from these stories." It's a small step, sure, but a confident step away from the culture wars and the controversies that usually distract rather than inform us.

When I wrote a broad comparative study about the state of natural history museums, *Stuffed Animals and Pickled Heads: The Culture and Evolution of Natural History Museums* (Oxford, 2001), I traced the evolution-versus-religion tension in public displays. The French were already over it, so to speak; they gave no real attention to a conflict or even a larger cultural conversation. The British offered a few obligatory nods to Darwin's critique of traditional design-argument theology (the theology that sought to infer a cosmic architect from Nature's complexity). But then Britain pressed ahead with proud nationalist displays of its favorite son; the fawning even increased in the Darwin bicentennial year.

I also observed the derelict natural history museums in Beijing and Shanghai, where Maoist-influenced atheism inspired plaques that condescendingly championed Darwinian primate origins over puerile religious stories.

American museums, a decade ago, still spent major museum space on the controversies of Christian fundamentalism versus evolution.[5] It is a small relief to see us moving on, at least in our museums.

At the Smithsonian's new exhibition, potentially disruptive political and theological debates—including everything from the meaning of life, to who controls our kids' textbooks—have been mercifully off-loaded to an interactive website and something called the Broader Social Impacts Committee, created in tandem with the exhibition. This is an interdisciplinary group that seeks to foster interfaith communication around the intersections of science and religion. The committee includes Jewish, Christian, Islamic, Buddhist, Hindu, and Humanist perspectives.

As a regular natural history museum visitor, I confess that I prefer the Smithsonian's method of off-loading the sticky political issues. Benign neglect of religious issues inside the museum space allows more room for science. But of course every visitor is different, and I recognize that the AMNH approach—explicit conciliatory comments about religion and science—may be just the thing for a tenderfoot visitor or someone torn by strict religious upbringing. The Smithsonian and AMNH offer two different museological strategies for dealing with these cultural ramifications of evolution.

MUSEOLOGY

Comparison of other museological strategies in the Smithsonian and AMNH halls is a fruitful exercise. Both museums are trying to bring the very latest research into their displays. In Darwin's day, an expedition (like the Beagle

voyage) might be out collecting specimens for several years, then these specimens would be analyzed for years back at home, slowly peer-reviewed by the scientific societies, and finally the findings would end up in museum displays. Even up to a decade ago, the pace of exhibition development and design could put years between a scientific discovery and its public display. This is no longer the case. Both the AMNH and Smithsonian halls can bring fresh research findings into the exhibition space in unprecedented ways.

At the AMNH we find the Sackler Educational Laboratory integrated into the final room of the Origins exhibition. We see how knowledge is discovered and constructed. Young people in particular can have hands-on experiences analyzing comparative genetic information as well as traditional fossil casts. Molecular and genetic analysis has changed paleoarchaeology, and it's finally changing museology too. This is a welcome addition to the traditional static approach to knowledge that dominated in earlier museology.

At the David H. Koch Hall, we find a section called "Smithsonian Research Station" that includes current dig-site findings in Southern China, Kenya, Tanzania, and Indonesia. These are some of the sites where the Smithsonian's Human Origins Program is actively conducting research. Briana Pobiner, education specialist and paleoanthropologist at the Smithsonian, was in the field—working at a dig in Kenya—and she told me that she was able to update the museum's display kiosk instantly from her laptop. That's a stunning tempo change in the relay of science to museum visitors.

The docent paradigm has also been evolving. Both the AMNH and Smithsonian have developed excellent, roaming fonts of wisdom, in the form of well-trained and enthusiastic volunteers. The new docent does not deliver a tired, canned speech, but improvises from a strong knowledge of the relevant subject matter. At the Smithsonian's Hall of Human Origins, my docent started riffing on different themes and questions. The entire exhibition embodies the lesson of ever-changing, improving science, but the docents can bring some of the freshest data to visitors. My docent, for example, explained new research—only two months old—that links Neanderthals and humans through cutting-edge DNA analysis. Recent testing has overturned a long-held view that Neanderthals and humans did not mate. We now discover, based on research from the Max Planck Institute in Leipzig, Germany, that some Neanderthals and humans interbred. If you are of European or Asian descent, you have a tiny bit of Neanderthal DNA in you. Contemporary African descendants do not have this Neanderthal DNA, and this suggests that the interbreeding occurred after the great migration out of Africa. We knew that Neanderthals and modern humans had some overlapping territories, but we did not know about their interbreeding. The Smithsonian docent could barely contain his own excitement and the visitors were transported by his enthusiasm.

Docent training and regular meetings between docents, researchers, and curators are all important parts of the Human Origins program at the Smithsonian. Briana Pobiner told me that regular meetings and online communities help the docents and other volunteers share information and even pedagogical strategies. Unlike many earlier museum displays, the Hall of Human Origins is not finished when the physical space is completed and the opening occurs. The new exhibition paradigm is to create a vital ongoing community process. It can update information with lightning speed, and

integrate research from diverse field sites. The exhibition is not just a post-factum representation of last year's science.

Another aspect of museological fine-tuning is the increasing immersion of the visitor into a dramatic virtual environment. To my mind, no one has matched the magical immersion offered in the Grande Galerie de l'Evolution in Paris, but American museums are finding their stride here, too. The Smithsonian is more successful than the AMNH. Although the Spitzer Hall has found ways to bring visitors closer to the specimens (as in the Laetoli exhibit, for instance), everything is still encased in glass; specimens and diorama scenes are always framed for the visitors. We still get the classic "don't touch" exhibit-enclosure philosophy that makes visitor suspension of disbelief almost impossible.

The Koch Hall, on the other hand, places life-sized sculptures of hominids and early humans in dramatic action poses right in the middle of the walkway. The bronze statues are stylized, looking very much like the classic Malvina Hoffman anthropology sculptures of the 1930s, but there is no barrier or glass framing and the visitor can touch them, sit next to them, and even trip over them. And visitor immersion is especially good in the Koch Hall's little theater grottos, where documentary and animation blend together to give visitors an adventure into the past.

Miniature movie theaters crop up throughout the Smithsonian exhibition. One asks, "What happened at Swartkrans two million years ago?" Titles like this draw us in to explore the new insights coming out of the Human Origins Project dig sites. We find pushbuttons correlated with specific movie clips. Each button and clip is part of a narrative that links together paleoarchaelogical specimens: tools, a leopard skull, a hominid skull with fang holes, and so on. After you get all the disconnected clues, you see an animated film that pieces them together. With a touch of pathos, we learn about the life and death of a Paranthropus boy who was killed by a leopard two million years ago.

These sorts of exhibitions not only show glimpses into *Homo* cooperation and culture, but also help us to understand the kinds of historical evidence-based inferences that "time travelling" scientists make in the course of their research. It's a window into paleoarchaeology itself. And in a country where scientific literacy is continually waning, these fun glimpses into scientific practice are absolutely vital. Recall that the Creation Museum builds its specious argument on the idea that inferences about the prehistoric past are open to radical alternatives—that origin science is much more fallible than operational science. But the Smithsonian exhibition gives us several step-by-step examples of how prehistorical reconstruction can be exemplary science: methodical, testable, corroborated, and fruitful.

MORALITY TALES

The developers of these new exhibitions worked to engage the emotions of visitors: their hearts as well as their heads. Of course, no contemporary museum is complete without a cautionary morality tale at the end, and both the AMNH and Smithsonian follow form. In the 1940s and 1950s, museum directors like Albert Eide Parr at the AMNH began to redirect their giant institutional "arks" toward the new mission of ecology education and research. In 1943, for example, Parr begged an esteemed group of curators at the Field Museum to follow his lead and focus the new museum message on local ecology rather than exotic safari-type entertainment. And besides, he argued, the old mission of educating citizens about evolution had been

successfully accomplished. That's right—curators in the 1950s believed that evolution theory was now firmly entrenched in the common sense of mainstream America. The irony is delicious. Dim the lights, cue the diorama of Ken Ham's evangelical anti-Darwin displays, and watch the rapid spinning of Albert Parr in his grave.

But Parr's message has been rekindled by the recent mainstreaming of the environmental movement. Museums keenly feel the responsibility of eco-ethics. To that end, both museums stress the way that humans—uniquely, among our evolved animal brethren—can significantly transform our environment. We have become ecological niche-makers. This brings new drama to our consideration of the future. Both exhibitions educate us about the facts: the earth is getting warmer, habitats and species are disappearing, natural resources are depleting, populations are rising beyond sustainable levels, and so on. But both exhibitions resist the heavy-handed doom-and-gloom approach, and give us instead some more nuanced glimpses into our possible future. The AMNH presents an optimistic response to the apocalyptic characterization that sometimes colors eco-ethics. We are encouraged to learn that "humans have an extraordinary capacity to improve the future. Given the wondrous achievements in human history, from the wheel to computers and spacecraft, our potential for advances in art, science and technology is incalculable. By taking an active role in transforming our world and ourselves, we will affect our destiny, for better or worse."

At the Smithsonian's David Koch Hall, we are reminded in an exhibit title that Humans Change the World. Charts walk us through Our Survival Challenge, including the unprecedented increase in CO_2 levels, sea-level rising, and pollution. But then a clever new interactive exhibit redirects us from a potential wallow in depression, to a practical application of critical thinking. I am informed by the computer screen that I've been transported to the future and I've just been elected leader of Zlandia, "one of the three great nations in the world." At first, I expected the distracting kid game that one often finds in obligatory hands-on museology, but in short order I was blitzed with a sequence of increasingly complex cause-and-effect (decision-and-consequence) scenarios. The visitor is presented with a series of environmental challenges and must choose from a series of options. Each choice takes the visitor on to scientifically credible consequences. The exercise is fun, challenging, and demands real ecological thinking. Moreover, it stresses the deep cause-and-effect consequences of environmental decision-making, without preaching a simple moral viewpoint. It even acknowledges, in some of the scenarios, that ecological planning is rarely a good-or-evil calculation, but a complex competition of mutually exclusive "goods" or values.

Another way to read all this optimistic faith in human ingenuity is that it's designed to make us complacent about the current climate emergency. Some analysts have pointed out that the main contributor to the Smithsonian's Hall, David Koch, is also a main funder of global warming skepticism groups. Koch and his Koch Industries make staggering profits from petroleum-based energy businesses, and Koch Industries has been fined by the EPA for pollution and oil spills. All parties vow that Koch had no input into the content of the Smithsonian exhibition, but this connection raises real questions about the way climate change has been handled in the displays. Is the message: Don't worry, we'll get ourselves out of any ecological jam we get into, using the same science that got us in? It's possible that something questionable like this is being proffered, but it's hard to know.

RACE

Just as the Creation Museum and the AMNH, in their very different ways, celebrate the unity of the human family in their exhibitions on race, the Smithsonian also has a climactic film called *We Are All One Species*. It's an edifying, even inspirational, tour of the deeper unity underneath our diversity, and it too contains animations and graphs of original human migrations. The video opens with people of different ethnicity asking "Where do I come from?" in each of their mother-tongues, and it closes the same way with each saying "We are all one species." In between, we learn that there were several major migrations out of Africa. Around two million years ago, *Homo erectus* migrated out of Africa and spread all around the Old World. Neanderthals emerged in this Old World diaspora around 200,000 years ago. Around the same time that Neanderthals were emerging in Europe as a speciation of *Homo erectus*, *Homo sapiens* was surfacing in Africa as a different speciation of *Homo erectus*. Then our *Homo sapiens* ancestors migrated out of Africa between 100,000 and 60,000 years ago, and slowly replaced the other human populations (*Homo erectus* and Neanderthals).

In the denouement of the Smithsonian film, we are told quite rightly that skin color and hair are adaptations. But then, somewhat surprisingly, we are informed that humans are not really separated into "what some people call 'races.'" We are informed that there is no such thing as race. The visitor is left with the impression that "race" is an idea that's as dead as the flat-earth theory, or the humoral theory of illness, or bogus phlogiston. But surely this is too much yearning, and not enough learning.

The yearning—which we find across all these museums and in our wider liberal culture—is for greater and greater egalitarianism. And who can fault us? Biology has indeed had a checkered past, as the creationists hasten to remind us. Biologists want to ensure that anthropological differences do not end up in the hands of racists as "evidence" of some hierarchy or evolutionary "progress." Museums fell into these ethnocentric traps in the past. One remembers the Musee d' lHomme in Paris, which displayed hominin skulls in an ascending sequence, culminating in Descartes's skull, the implied French pinnacle of evolution.

As museologist Stephanie Moser admonishes us, human evolution exhibitions have to be cognizant of racist tendencies in the visiting public (Moser 2003). Developers in all these origin museums—sacred and secular—have taken heed of her warning and have sought to use their origin narratives as a vehicle for building human solidarity. For creationists, it's a common story of races "out of Eden" or "out of Noah." The secular version emphasizes both our "out of Africa" origin, and our remarkable common genetic identity. Obviously, these are not equivalent stories. The secular story has the advantage of being factually true.

Museums and science educators should be careful, however. The moral message that gets distilled out of these paleontological facts is unassailable and sincerely noble, but we can understand egalitarianism without denying obvious facts about humans. Racism is bad; the idea of race is not. Social constructionists in the humanities and social sciences have had an undue influence by denying every biological category—vilifying biological concepts of race and gender as oppressive tools. Science museums should resist the politically correct temptation. Responding to those who deny such a thing as a human race, the biologist Ernst Mayr wrote: "Those who subscribe to this opinion are obviously ignorant of modern biology. Races are not something specifically human; races occur in a

large percentage of species of animals. You can read in every textbook on evolution that geographic races of animals, when isolated from other races of their species, may in due time become new species. The terms 'subspecies' and 'geographic race' are used interchangeably in this taxonomic literature" (Mayr 2002).

There is no value judgment intrinsic in the scientific idea of race, but I agree that we should remain ever vigilant. Nonetheless, making museum visitors think that the very idea of race is dead (and possibly even racist) is not, despite the best of intentions, a viable way forward.

SCIENTIFIC SIGNIFICANCE

Having made this comparative tour of new rhetorical museological methods, let me now sing the praises of the science itself. The new human evolution halls have done an excellent job of conveying the crucial advances in origins science. Rick Potts at the Smithsonian, in particular, has built the entire David Koch Hall of Human Origins around the forceful theory that the human brain exploded in size and complexity as a response to intense climate change. Climate change was extreme between 800,000 years ago and 200,000 years ago—a time of radical temperature fluctuations and geological transformation.

Extreme climate changes mean intense survival pressures. Thinking patterns, behaviors, and social strategies that work well in the jungle are not necessarily effective in the woodland fringe environments, or on the grassland savannah, or on the coasts. Quick adaptability to new environments and resources is crucial. A bigger brain, with better memory, reasoning abilities, and social skills, probably emerged as a rapid and powerful information processor, according to Rick Potts and the Hall of Human Origins.

The Smithsonian exhibition is generally interested in the complex relationships between human adaptations and climate changes. The entry hall displays this pitch: "Travel back six million years to discover how our ancestors struggled to survive dramatic climate changes and, in the process, evolved the traits that make us human." One of the first lessons visitors get is a debunking of the old view of "big brains first."

A walking docent, wired with a microphone headset, explains to groups of visitors the significance of the Lucy discovery. Perhaps the most famous hominin fossil, Lucy was found in 1974 in Ethiopia. A nearly complete specimen of *Australopithecus afarensis*, Lucy is approximately 3 million years old. Prior to Lucy, archaeological wisdom held that the brain got big first, then the other human traits (upright bipedalism, social skills, and so on) followed. But the docent—pointing out features of the skeleton—informed us that Lucy clearly walked on two legs, and her brain was only one-fourth our brain size. Out went the theory of big brain first, our docent explained. Slowly, in came the theory of a late brain boom. This, it turns out, is a major theme of the Smithsonian's new exhibition.

Instead of thinking about human origins as a series of jumps or a radical innovation, we are taken through a more nuanced picture of evolution. The brain boom is significant, but it's not the magic bullet of human evolution. Both the Smithsonian and the AMNH Halls of Human Origins invite us to think about what it means to be human. But the Smithsonian effectively stresses how these unique human abilities originated piecemeal and discretely, rather than *en bloc*. Bipedalism comes early, for example—around six million years ago. Tool making, another defining ability, comes around three million years ago. Hearth gathering appears around one million years ago. And the brain explosion occurs around five hundred thousand

years ago. So many of our human abilities emerged in the last one million years: hearth gathering, the brain boom, communication with symbols, 250,000 years ago; longer childhood and adolescence, 160,000 years ago; plant and animal domestication 10,000 years ago.

Some of this has been well known by scientists for years, but the museum is trying to convey these points to a public that still misconceives evolution as a series of jumps. We still think of *Homo sapiens* as a discrete moment of speciation, though it was really a piecemeal buildup of anatomical, social, and cognitive traits. In fact, the AMNH exhibition, which still tends to break dioramas into discrete taxonomic clades, might be feeding some of these public misconceptions of abrupt speciation.

The Smithsonian also seems superior when it comes to the scientific nuances of evolution theory. As with the ecology exhibition, the Smithsonian continues the cost/benefit approach in all its representations of evolution. Visitors are not given the old-fashioned progress story—the master-narrative of chronological ascent. Instead, the visitors amble around the "bush-like" (rather than linear) floorplan, and discover that getting a big brain actually "costs" a lot in terms of biological energy and efficiency. The benefits of a big brain include the ability to store decades' worth of information between your ears, the ability to quickly collect and process information for behavioral output, and the rational and creative engines for culture. But big brains gobble up huge amounts of energy. A mere 2 percent of your body weight is consuming 20 percent of your oxygen supply and blood flow. And big brains also mean large heads that make childbirth more difficult and dangerous. Here, and in other parts of the exhibition, we learn the valuable lesson: new adaptive traits come with costs. And to strengthen our appreciation of evolution's mosaic-like causal processes, we find new structures and functions (like big brains) tied to other changes in the ecology, culture, and genetics of the hominids. Energy consumption, for example, is linked to increases in meat-eating and also cooking. And there is a brief nod to recent research revealing how a genetic mutation, which reduces the jaw muscle on our skulls, loosens the biomechanical pressure that keeps the primate brain case small; this mutation freed the flexible space for brain growth. These causal complexities are hard to convey in museum displays, but the new museology is on the path.

One of the topics that has proven very tricky for evolution exhibitions is the human mind. Tracking how the anatomical body transformed over time is one thing, but some of the most interesting stuff that makes us human is intangible and impossible to fossilize: language, cognition, emotions, and other developments of the brain-based subjective life. The evolution of mind is the hardest phenomenon to decode from paleontological data of preliterate man, so speculation abounds. Most museums understandably just display tools and art—the cultural products of mind. This convention won't change anytime soon.

As the timeline of the Smithsonian exhibition draws nearer to the present, we meet an interesting set of displays entitled Creating a World of Symbols. We are forced to draw inferences about human intelligence based upon the sparsest of physical evidence. It's not like inferring bipedalism from the evidence of hominid hip anatomy. Here scientists try to infer whether or not *Homo* possessed language and what this means for cognition—for human mind and culture—from cryptic cave painting symbols and adornment detritus. We have evidence of jewelry—perforated shell beads, ivory ornaments, and carvings—over 100,000 years ago, and the fabrication of these complex

Photo 8. In the Koch Hall of Human Origins at the Smithsonian, one of the bronze sculptures of hominids and early humans, in front of a display titled "Social Life." *Photo by Chip Clark, Smithsonian Institution, courtesy of the National Museum of Natural History.*

objects suggests the use of social language. By 40,000 years ago humans are doing lots of cave painting, burial ceremonies, adornment carving, bone engraving, and so on. By 17,000 years ago all the representational conventions of cave painting are in place and regularly replicated. And by 8,000 years ago we have plenty of evidence that humans are using symbols to represent words and concepts.

One of the more interesting aspects of Rick Potts's Smithsonian exhibition, with its climate-change theory of the brain boom, is the implication it has for the "evolution of mind" debate. The average visitor may not be entirely sensitive to the relevant debate, but will imbibe Potts's side of the argument, since it permeates the whole exhibition. The debate, simply put, is between those theorists who think the mind evolved as a series of independent problem-solving modules (like separate gears in a watch), versus those who think the mind evolved as a very general open-ended problem-solving intelligence. It's the debate between modular intelligence versus general intelligence.

Perhaps the most famous mental "module" is Noam Chomsky's deep-grammar language program. Chomsky famously argued that our language capacity is too difficult to pick up through general intelligence processing, and so it must be a genetically engraved, brain-based program that just does one thing: acquire and employ language. The language module has to be activated by specific cultural languages, but the deep grammar is innate. This modular view of the mind has been adopted by some very famous and influential evolutionary psychologists, like Stephen Pinker, Leda Cosmides, and John Tooby. These evolutionary psychologists,

Photo 9. The video screen asks "What happened at Shanidar nearly 65,000 years ago?" The answer is on a kiosk: Neanderthals buried their dead, long before human species did. *Photo by Chip Clark, Smithsonian Institution, courtesy of the National Museum of Natural History.*

who are regularly quoted as authorities in *Time* magazine, *The Economist*, and other popular media, have applied Chomsky's module idea to almost every other mental activity. They believe that many of our psychological tendencies were sculpted by evolution during the Pleistocene era. According to them, everything—from what kind of food we like, to what kind of spouse we're looking for (with specific hip/waist ratio)—is generated by a separate taste module, or mate module, or whatever. Our phobias of snakes and spiders, our preference for certain kinds of stories, even our ability to detect cheaters in a group, have all been attributed to specialized programs in the brain. Evolutionary psychologists claim that our minds got built in the Stone Age, and we now inherit these prehistoric modules. The jury is still out on whether they are correct about these specialized abilities, but they are certainly winning the day in the popular press, where neat, formulaic answers to psychological puzzles play well.

But one of the principal claims that anchor the modular theory is that our minds evolved in an extremely stable environment. If our current minds are kluges (quick-and-dirty problem solvers[6]) of Pleistocene adaptations, then the era of mind/brain development must have been relatively stable, and the habitat unwavering, so that natural selection could sculpt each module to properly limn the perennial environmental challenges. But Rick Potts and the Smithsonian exhibition are showing us now that the environment was anything but stable during the Pleistocene brain-boom era. In fact, the exhibition argues, it was precisely the chaos of this era that created our multipurpose problem solving minds. If the weather, and the foraging and

Photo 10. Lucy, the poster girl of *Australopithecus afarensis,* shown in action in a diorama. *Photo by Chip Clark, Smithsonian Institution, courtesy of the National Museum of Natural History.*

hunting context, is changing radically, then hardwired specialized modules aren't going to do us much good. What we need is all-purpose intelligence that can perceive new challenges and apply general logical rules and cultural folkways to solving them. Remains of ancient hominins, especially *Homo*, are found in very diverse habitats in highly fluctuating climates. The encephalization of the brain corresponds with an increasingly flexible, adaptable mind. In this view, our mind might be called the ultimate "jack of all trades." So the Smithsonian exhibition is doing more than simply laying out the bones, so to speak. It is engaging in important and vital scientific debates.

These three different case studies—New York, Washington D.C., and Kentucky—give us a wonderful glimpse into early twenty-first-century American fascination with origins. There are ridiculous differences between the secular and sacred origin stories, but a shared commitment, too. Understanding our origins will tell us important information about who we are today. Real museological advances can be witnessed in these museums. The edutainment at AMNH and Smithsonian has grown more

sophisticated. And the science at these institutions is vital and important. But politics and ideology are always looming in the wings, trying to get on stage and influence the rhetoric of display. The challenge for museum people, as always, will be to balance the inspiration of origins with the facts—the yearning with the learning. END

NOTES

1. The idea that Ham's descendents were damned to servitude was often employed by anti-abolitionists in nineteenth-century America to justify the slavery of imported Africans, particularly between the years of 1830–1865. (See chapters four and five of Haynes 2002). On the face of it, the curse of Ham episode makes little sense. A son sees his father naked and because of this, Noah damns all subsequent generations to live in servitude. The narrative seems incoherent on both dramatic and theological grounds. The Christian interpretations, found in Augustine and Ambrose among others, are rather symbolic and cryptic. According to Augustine, Noah's naked state is symbolic of Christ's vulnerability, the passion itself. And according to Augustine, Ham actually laughs at or derides his naked father, symbolizing the betrayal of Jesus by the Jews, Christ's own family. See Book XVI of Augustine's *The City of God*.
2. See John S. Haller, *Outcasts From Evolution* (1996).
3. See Moser (2003).
4. Eugenie Scott is the longtime executive director of the National Center for Science Education. Ken Miller is a high profile Catholic biologist at Brown University.
5. Close to the end of the Field Museum's *Life Over Time* exhibition (open from 1999–2007), for example, there was a plaque that asked in bold letters: "Who are we? Just animals, or something more?" Contrary to the French and British museums, the American museum practically baits you into raising your anti-reductionist dander. Paper and pencils were supplied for visitors to post feedback. Many hostile notes ("I'm not a monkey!") were tacked up. In smaller type, on this Field Museum plaque, the text continued by making a familiar distinction. "Science asks and answers the questions 'How?' How did modern humans come to be? Evidence for the scientific answer is overwhelming—we evolved from earlier not-quite-human relatives. Science does not answer the question 'Why?' That's for other kinds of thinkers to answer."
6. See http://en.wikipedia.org/wiki/Kludge.

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